

- 1        1.    A method comprising:
  - 2               forming a phase change material between a pair of
  - 3        horizontally spaced electrodes.
  
- 1        2.    The method of claim 1 including enabling light to
  - 2        access said phase change material.
  
- 1        3.    The method of claim 1 including forming a
  - 2        conductive line in a substrate and forming said material
  - 3        and said electrodes over said substrate.
  
- 1        4.    The method of claim 3 including forming a
  - 2        selection device in said substrate.
  
- 1        5.    The method of claim 4 including forming a
  - 2        electrical connection from said substrate to a second
  - 3        electrode.
  
- 1        6.    The method of claim 5 including electrically
  - 2        coupling said second electrode to one of said horizontally
  - 3        displaced electrodes.
  
- 1        7.    The method of claim 1 including covering at least
  - 2        a portion of said phase change material with an optically
  - 3        transmissive material.

1       8. The method of claim 1 including forming two pairs  
2 of electrodes for two spaced cells at the same time.

1       9. The method of claim 8 including depositing a  
2 material to form said electrodes in a trench.

1       10. The method of claim 9 including clearing the  
2 bottom of the trench to separate said electrodes and  
3 filling the remaining portion of said trench with the phase  
4 change material.

1       11. The method of claim 1 including covering said  
2 phase change material with a light transmissive material.

1       12. A memory comprising:  
2            a pair of horizontally spaced electrodes; and  
3            a phase change material between said pair of  
4 horizontally spaced electrodes.

1       13. The memory of claim 12 wherein said spaced  
2 electrodes and said phase change material are formed over a  
3 substrate having a horizontally disposed upper surface.

1       14. The memory of claim 12 including a light  
2 transmissive material over said phase change material.

1       15. The memory of claim 14 wherein said light  
2 transmissive material is a non-switching high bandgap, and  
3 electrically insulating chalcogenide material.

1       16. The memory of claim 12 wherein said phase change  
2 material is a chalcogenide material.

1       17. The memory of claim 12 wherein said spaced  
2 electrodes sandwich the phase change material, one of said  
3 spaced electrodes being shorter than the other of said  
4 electrodes, an optically transmissive material contacting  
5 the shorter of said spaced electrodes and said phase change  
6 material.

1       18. The memory of claim 17 wherein said phase change  
2 material is sandwiched laterally between parallel plate  
3 electrodes.

1       19. The memory of claim 18 including a substrate and  
2 a selection device in said substrate, said selection device  
3 coupled to a second electrode above said substrate, said  
4 second electrode coupled to a conductive material in turn  
5 coupled to the shorter of said spaced electrodes.

1           20. The memory of claim 17 including a pair of cells  
2 positioned side by side, each cell including said  
3 horizontally spaced electrodes with a phase change material  
4 between said electrodes, an optically transparent material  
5 arranged so as to extend over the phase change material  
6 memory of each cell, said cells being separated by an  
7 insulating material.

1           21. The memory of claim 20 wherein each cell includes  
2 a conductor coupled to a selection device in said  
3 substrate, each conductor in turn coupled to an  
4 electrically conductive via that couples said conductor to  
5 the shorter of said spaced electrodes.

1           22. A system comprising:  
2            a controller;  
3            a wireless interface coupled to said processor-  
4 based device; and  
5            a semiconductor memory coupled to said device,  
6 said memory including a phase change material and a pair of  
7 horizontally spaced electrodes sandwiching said phase  
8 change material.

1           23. The system of claim 22 wherein said phase change  
2 material is a chalcogenide.

1        24. The system of claim 22 wherein said spaced  
2 electrodes and said phase change material are formed over a  
3 substrate having a horizontally disposed upper surface.

1        25. The system of claim 22 including a light  
2 transmissive material over said phase change material.

1        26. The system of claim 22 wherein said wireless  
2 antenna includes a dipole antenna.